

## ABSTRACT

A full-field breast ultrasound (FFBU) scanning apparatus and related methods are described for compressing and ultrasonically scanning a breast. A first surface of an at least partially conformable, substantially taut membrane or film sheet compresses one side of the breast, and the other side of the breast is compressed by a compression assembly comprising a rigid compression plate and an inflatable air bladder. A transducer translation mechanism holds a transducer surface against a second surface of the film sheet while translating the transducer thereacross to scan the breast. An irrigation system automatically maintains a continuous supply of coupling agent at an interface between the transducer surface and the film sheet as the transducer is translated. A recycling system collects used coupling agent for re-use by the irrigation system. The transducer is housed in a substantially closed environment to prevent evaporative acoustic couplant loss and to allow scanning at many different angles without couplant loss. A variety of other usability, patient comfort, and safety features are also described.